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EXAMINER	
BORSETTI, GREG	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/582,025	VIRETTE ET AL.	
	Examiner	Art Unit	
	GREG A. BORSETTI	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _15 October 2009_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-29_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-29_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-29 are pending.

2. Claims 1, 13, 22-25, 27, and 29 have been amended.

3. The objection to the specification has been withdrawn.

4. The objections to claims 13, and 22-25 have been withdrawn.

5. The 112 second paragraph rejection of claims 1, 24, and 25 have been withdrawn.

6. The 35 USC 101 rejections of claims 1-23, and 28 have been withdrawn.

7. The indicated allowability of claims 13 and 29 is withdrawn in view of the newly discovered reference(s) to Jabri (US Patent #7254533). Rejections based on the newly cited reference(s) follow.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/15/2009 has been entered.

Response to Arguments

8. Applicant’s arguments, see Remarks, filed 10/15/2009, with respect to the

rejection(s) of claim(s) 1-2, 7-12, 15-16, 21-22, and 24-28 under 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Jabri (US Patent #7254533).

Claim Objections

9. Claim 1 is objected to because of the following informalities: Claim 1's common functional unit in the last limitation should be "the common functional unit" instead of "a common functional unit" so that the if statement corresponds to the same functional unit. Appropriate correction is required.

10. Claims 6 and 11 are objected to because of the following informalities: In claim 6, the Examiner believes that the last limitation should be "down to the coder with the lowest bit rate" instead of "up to…" Similar changes should be considered for claim 11. Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

11. Claims 25-26 are also rejected under 35 USC 101 for being nonstatutory. Although independent claim 25 recites system type elements, these elements are disclosed in the specification (Page 7, Lines 10-22) as a software embodiment, and

when treated as a whole, the claims are more toward a non-statutory embodiment and not necessarily a hardware embodiment. The Examiner notes that the inclusion of a "memory of a processor unit" will overcome this rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 1-16, 21-26, and 28-29 are rejected under 35 U.S.C. 103(a) as being taught by Kolesnik et al. (US Patent # 5729655) in view of Jabri et al. (US Patent #7254533) and further in view of Seo et al. (NPL Document "A Novel Transcoding Algorithm for SMV and G.723.1 Speech Coders via Direct Parameter Transformation").

As per claim 1, Kolesnik teaches:

providing a multiple compression coding via a plurality of coding techniques by the first coder and the second coder; (Kolesnik, Fig. 2A and Fig. 4, show a parallel multi-mode coding scheme and the comparator and controller (210) is shown to select the mode.)

Kolesnik fails to specifically teach, but Jabri supplements:

feeding an input signal in parallel to at least the first and second coder, each coder comprising a succession of functional units for compression coding of said input signal by each of the first and second coders, the first and second coders respectively comprising at least a first and a second functional unit for performing common operations; (Kolesnik, Fig. 4, shows an input signal going in parallel to a plurality of coders. Kolesnik does not specifically teach a first and second functional unit for performing common operations. Jabri, coumn 6, lines 8-24, teaches …*The unquantized values for linear prediction parameters, pitch lags, and pitch gains are also usually generic CELP parameters*… Fig. 3 further teaches generic parameters (common operations).)

calculating, by at least a part of the functional units with the processor unit, respective parameters for coding of the input signal by each coder; (Jabri, coumn 6, lines 8-24, teaches …*The unquantized values for linear prediction parameters, pitch lags, and pitch gains are also usually generic CELP parameters*… Fig. 7 further teaches generic pre-processing.)

performing calculations for delivering a same set of parameters to the first functional unit and to the second functional unit in a same step and in a same functional unit; (Jabri, coumn 6, lines 8-24, teaches …*The unquantized values for linear prediction parameters, pitch lags, and pitch gains are also usually generic CELP parameters*… Fig. 7 further teaches generic pre-processing.)

It would have been obvious to someone of ordinary skill in the art at the time of the invention to combine Jabri with Kolesnik to reduce program size and computational

cost by performing common functions once and distributing their results. (column 2, lines 35-59 and column 4, lines 26-39)

Kolesnik and Jabri fail to specifically teach, but Seo teaches:

if at least one of the first and the second coder operates at a rate that is different from a rate of a common functional unit, adapting the parameters to the respective rate of at least one respective said first coder and said second coder in order to be used by the at least one of said first and second functional unit respectively; and (Seo, section 2.2, teaches a rate-determination algorithm based on the classification. It would have been obvious to someone of ordinary skill in the art to apply a rate adaptation to adjust the rate based on the differences between the functional units and the respective coders.)

if the first and the second coders operate at a rate that is the same as a rate of a common functional unit, then providing the parameters to the first and second functional units without adaptation. (Seo, section 2.2, teaches a rate-determination algorithm based on the classification. It would have been obvious to someone of ordinary skill in the art at the time of the invention that if the rates of the functional units and the respective coders are equivalent, no rate adaptation is necessary.)

It would have been obvious to someone of ordinary skill in the art at the time of the invention to combine Seo with Kolesnik and Jabri to use a rate-determination algorithm to adapt between coded information of different bitrates for transcoding

between the generation of common parameters (such as generating line spectral pairs) through the functional units and the respective coders.

As per claim 2, claim 1 is incorporated and Kolesnik fails to specifically teach, but Jabri teaches:

wherein the common functional unit comprises at least one of the function units of one of the first and second coders. (Jabri, coumn 6, lines 8-24, teaches …*The unquantized values for linear prediction parameters, pitch lags, and pitch gains are also usually generic CELP parameters*… Fig. 3 and Fig. 7 further teach generic parameters (common operations).)

It would have been obvious to someone of ordinary skill in the art at the time of the invention to combine Jabri with Kolesnik to reduce program size and computational cost by performing common functions once and distributing their results. (column 2, lines 35-59 and column 4, lines 26-39)

As per claim 3, claim 28 is incorporated and Kolesnik teaches:

for efficient coding verifying an optimum criterion between complexity and coding quality; (Kolesnik, column 7, lines 49-51, …*To reduce the computational complexity of the search through the SCB, SCB analyzer 209 may be implemented as a trellis codebook*…, Furthermore, Kolesnik, column 5, lines 5-10, …*Compared to the Code Excited Linear Prediction (CELP) analyzer, one embodiment of the present invention reduces the number of bits needed for speech storing, or transmitting, without*

a significant loss in the subjective speech quality..., Kolesnik accounts for efficient coding to optimize the complexity and coding quality while reducing bit rate.)

Kolesnik fails to specifically teach, but Jabri teaches:

wherein, for each function executed in the executing step, at least one functional unit is used of a coder selected from said plurality of coders and the functional unit of said coder selected is adapted to deliver partial results to the other coders, (Jabri, coumn 6, lines 8-24, teaches ...*The unquantized values for linear prediction parameters, pitch lags, and pitch gains are also usually generic CELP parameters*... Fig. 3 and Fig. 7 further teach generic parameters (common operations).)

It would have been obvious to someone of ordinary skill in the art at the time of the invention to combine Jabri with Kolesnik to reduce program size and computational cost by performing common functions once and distributing their results. (column 2, lines 35-59 and column 4, lines 26-39)

As per claims 4 and 5, claim 3 is incorporated and Kolesnik teaches:

the selected coder is the coder with the lowest (highest) bit rate and the results obtained after execution of the function in the executing step with parameters specific to the selected coder are adapted to the bit rates of at least some of the other coders by a focused parameter search for at least some of the other modes up to the coder with the highest (lowest) bit rate; (Kolesnik, column 8, lines 18-25, ...*Since different excitation search modes require differing numbers of bits for excitation coding, the bit*

rate value is variable from frame to frame. The largest number of bits is required by SACBS mode while the smallest ACB mode is required. To reduce, or to limit, the bit rate, without a substantial loss in speech quality, some restrictions on the search mode usage may be imposed optionally… Then, Kolesnik, column 8, lines 45-62, describes search mode selection involving …*weighting coefficients effect the probability that a certain mode will be chosen for a given subframe. Through empirical study, the weighting coefficient of Table 2 have been found to provide subjectively good quality speech with a minimum average data rate…*, Kolesnik provides bit rate adjustment using the weighting coefficients which, in effect, provides an equivalent step in varying the bit rate based upon the searching mode that is chosen for the coder. It would have been obvious given the information in claim 3 that the weighting coefficients would be shared across chosen coders such that coders of different bit rates would be accounted for whether the initial rate was highest or lowest.)

As per claim 6, claim 4, is incorporated and Kolesnik teaches:

the functional unit of a coder operating at a given bit rate is used as the calculation module for that bit rate and at least some of the parameters specific to that coder are progressively adapted: up to the coder with the highest bit rate by focused searching; and up to the coder with the lowest bit rate by focused searching. (Kolesnik, column 8, lines 18-25, …*Since different excitation search modes require differing numbers of bits for excitation coding, the bit rate value is variable from frame to frame. The largest number of bits is required by SACBS mode while the smallest ACB*

mode is required. To reduce, or to limit, the bit rate, without a substantial loss in speech quality, some restrictions on the search mode usage may be imposed optionally…, Then, Kolesnik, column 8, lines 45-62, describes search mode selection involving …*weighting coefficients effect the probability that a certain mode will be chosen for a given subframe. Through empirical study, the weighting coefficient of Table 2 have been found to provide subjectively good quality speech with a minimum average data rate…*, Kolesnik provides bit rate adjustment using the weighting coefficients which, in effect, provides an equivalent step in varying the bit rate based upon the searching mode that is chosen for the coder. It would have been obvious given the information in claim 3 that the weighting coefficients would be shared across chosen coders such that coders of different bit rates would be accounted for whether the initial rate was highest or lowest.)

As per claim 7, claim 1 is incorporated and Kolesnik teaches:

the functional units of the various coders are arranged in a trellis with a plurality of possible paths in the trellis, wherein each path in the trellis is defined by a combination of operating modes of the functional units and each functional unit feeds a plurality of possible variants of the next functional unit; (Kolesnik, column 14, lines 18-24, …*The block diagram in FIG. 5 shows an implementation of a multi-mode trellis encoding and linear prediction (MM-CELP) speech synthesizer. The synthesizer accepts compressed speech data as input and produces a synthesized speech signal. The structure of the synthesizer corresponds to that of the analyzer of FIG. 2, except*

that trellis encoding has been used… Kolesnik discloses the use of a trellis coding structure in which the analyzer of Fig. 2 also uses the trellis structure. The analyzer of Fig. 2 provides variable rate LSP encoder 202 (Fig. 4). Kolesnik thus teaches the use of a trellis structure for the coders where the trellis provides an interconnected structure connecting the various function units.)

As per claim 8, claim 7 is incorporated and Kolesnik teaches:

a partial selection module is provided after each coding step conducted by one or more functional units capable of selecting the results supplied by one or more of those functional units for subsequent coding steps; (Kolesnik, column 12, lines 25-28, …*FIG. 4 shows an implementation of the variable rate LSP encoder 202. The LSP encoder 202 uses m quantized LSPs and comprises three schemes for LSP predicting and preliminary coding…*, As shown in Fig. 4, there is a codeword selector (412) that teaches a partial selection module because it selects the results supplied by the function units of the variable rate encoders prior to the encoding (213) as shown in Fig. 2A where Fig. 2A highlights the variable rate LSP encoder (202) in general.)

As per claims 9 and 10, claim 7 is incorporated and Kolesnik teaches:

for a given functional unit, the path selected in the trellis is that passing through the lowest bit rate functional unit and the results obtained from said lowest (highest) bit rate functional unit are adapted to the bit rates of at least some of the other functional units by a focused parameter search for at least some of the other functional units up to

the highest (lowest) bit rate functional unit. (Kolesnik, column 14, lines 18-24, as shown in claim 7 describes how a trellis structure is applied to Kolesnik in accordance with the instant application. Furthermore, it has been shown in claim 5 (Kolesnik, column 8, lines 18-25) and (Kolesnik, column 8, lines 45-62) that Kolesnik provides bit rate adjustment using the weighting coefficients which, in effect, provides an equivalent step in varying the bit rate based upon the searching mode that is chosen for the coder. It would have been obvious given the information in claim 3 that the weighting coefficients would be shared across chosen coders such that coders of different bit rates would be accounted for whether the initial rate was highest or lowest.)

As per claim 11, claim 10 is incorporated and Kolesnik teaches:

the functional unit operating at said given bit rate is used as the calculation module and at least some of the parameters specific to that functional unit are progressively adapted: up to the functional unit capable of operating at the lowest bit rate by focused searching; and up to the functional unit capable of operating at the highest bit rate by focused searching. (Kolesnik, column 8, lines 18-25, …*Since different excitation search modes require differing numbers of bits for excitation coding, the bit rate value is variable from frame to frame. The largest number of bits is required by SACBS mode while the smallest ACB mode is required. To reduce, or to limit, the bit rate, without a substantial loss in speech quality, some restrictions on the search mode usage may be imposed optionally*… Then, Kolesnik, column 8, lines 45-62 describes search mode selection involving …*weighting coefficients effect the probability*

that a certain mode will be chosen for a given subframe. Through empirical study, the weighting coefficient of Table 2 have been found to provide subjectively good quality speech with a minimum average data rate… Kolesnik provides bit rate adjustment using the weighting coefficients which, in effect, provides an equivalent step in varying the bit rate based upon the searching mode that is chosen for the coder. It would have been obvious given the information in claim 3 that the weighting coefficients would be shared across chosen coders such that coders of different bit rates would be accounted for whether the initial rate was highest or lowest.)

As per claim 12, claim 28 is incorporated and Kolesnik fails to teach, but Jabri suggests:

wherein said calculation module is independent of said coders and is adapted to redistribute results obtained in the executing step to all the coders. (Jabri, coumn 6, lines 8-24, teaches …*The unquantized values for linear prediction parameters, pitch lags, and pitch gains are also usually generic CELP parameters*… Fig. 3 and Fig. 7 further teach generic parameters (common operations). Fig. 7's “generic” processing and encoding steps are independent of the specific processing and encoding steps.)

It would have been obvious to someone of ordinary skill in the art at the time of the invention to combine Jabri with Kolesnik to reduce program size and computational cost by performing common functions once and distributing their results. (column 2, lines 35-59 and column 4, lines 26-39)

As per claim 13, claim 12 is incorporated and Kolesnik fails to specifically teach, but Jabri teaches:

wherein the independent module and the functional unit or units of at least one of the coders are adapted to exchange results obtained in the executing step with each other (Jabri, coumn 6, lines 8-24, teaches …*The unquantized values for linear prediction parameters, pitch lags, and pitch gains are also usually generic CELP parameters*… Fig. 3 and Fig. 7 further teach generic parameters (common operations). Fig. 7's “generic” processing and encoding steps are used to generate codec bitstreams including specific information specific to the codecs.)

It would have been obvious to someone of ordinary skill in the art at the time of the invention to combine Jabri with Kolesnik to reduce program size and computational cost by performing common functions once and distributing their results. (column 2, lines 35-59 and column 4, lines 26-39)

Kolesnik and Jabri fail to specifically teach, but Seo teaches:

and the calculation module is adapted to effect adaptation transcoding between functional units. (Seo, abstract and section 3.2, teaches a transcoding technique using direct parameter transformation. Line Spectral Pairs are directly converted to reduce algorithmic delay. Jabri, Fig. 3 teaches that linear prediction parameters are generic where linear prediction parameters are used to generate LSP's.

Therefore, it would have been obvious to someone of ordinary skill in the art at the time of the invention to combine Seo with Kolesnik and Jabri to transcode between

SMV and G.723.1 by a direct parameter transformation instead of tandem transcoding because computational complexity is reduced. (Seo, Section 3.2)

As per claim 14, claim 12 is incorporated and Kolesnik fails to specifically teach, but Jabri teaches:

the independent module includes a functional unit for performing operations of a coding process; (Jabri, coumn 6, lines 8-24, teaches …*The unquantized values for linear prediction parameters, pitch lags, and pitch gains are also usually generic CELP parameters*… Fig. 3 and Fig. 7 further teach generic parameters (common operations). Fig. 7's “generic” processing and encoding steps.)

It would have been obvious to someone of ordinary skill in the art at the time of the invention to combine Jabri with Kolesnik to reduce program size and computational cost by performing common functions once and distributing their results. (column 2, lines 35-59 and column 4, lines 26-39)

Kolesnik and Jabri fail to specifically teach, but Seo teaches:

an adaptation transcoding functional unit. (Seo, abstract and section 3.2, teaches a transcoding technique using direct parameter transformation. Line Spectral Pairs are directly converted to reduce algorithmic delay. Jabri, Fig. 3 teaches that linear prediction parameters are generic where linear prediction parameters are used to generate LSP's.

Therefore, it would have been obvious to someone of ordinary skill in the art at

the time of the invention to combine Seo with Kolesnik and Jabri to transcode between SMV and G.723.1 by a direct parameter transformation instead of tandem transcoding because computational complexity is reduced. (Seo, Section 3.2)

As per claim 15, claim 1 is incorporated and Kolesnik teaches:

the coders in parallel are adapted to operate multimode coding and an a posteriori selection module is provided capable of selecting one of the coders. (Kolesnik, Fig. 2A , shows a parallel multi-mode coding scheme and the comparator and controller (210) is shown to select the mode.)

As per claim 16, claim 15 is incorporated and Kolesnik teaches:

a partial selection module is provided that is independent of the coders and able to select one or more coders after each coding step conducted by one or more functional units. (Kolesnik, column 5, lines 23-24, …*In one embodiment, a set of admissible modes is determined based upon the mode used in the previous subframe*… The comparator and controller (210) is independent of the coders and able to select the mode of the coders after the coding step of the previous frame is complete which teaches the after each coding step conducted by one or more functional units in the instant application.)

As per claim 21, claim 1 is incorporated and Kolesnik teaches:

the coders are of the analysis by synthesis type and the method includes steps

common to all the coders including: preprocessing; (Kolesnik, column 5, lines 53-57, …*The digital speech signal, which is typically sampled at 8 KHz, is first processed by a digital pre-filter 200. The purpose of such pre-filtering, coupled with the corresponding post-filtering, is to diminish specific synthetic speech noise*… The preprocessing of filtering the synthetic speech noise is common to all the coders.)

linear prediction coefficient analysis; (Kolesnik, column 5, lines 10-13, …*Compared to the Code Excited Linear Prediction (CELP) analyzer, one embodiment of the present invention reduces the number of bits needed for speech storing, or transmitting, without a significant loss in the subjective speech quality. These advantages are achieved by: using three different excitation search modes, instead of two modes employed in CELP, together with a special strategy of mode selection, and by using an efficient LPC coding*… The LPC coding would inherently include LPC analysis.)

weighted input signal calculation; and (Kolesnik, column 6, lines 41-43, …*As in CELP, perceptual weighting is realized by passing the prefiltered speech signals through the weighting filter (WF)*… The input signals are weighted in a filter to reduce speech noise lying in audible regions.)

quantization for at least some of the parameters. (Kolesnik, column 5, lines 60-64, …*Pre-filtered speech is analyzed by short-term prediction analyzer 201. Short-term prediction analyzer 201 includes a linear prediction analyzer, a converter from linear prediction coefficients (LPC) into line spectrum pairs (LSPs) and a quantizer of the LSPs*… The line spectrum pairs are parameters and are quantized.)

As per claim 22, claim 21 is incorporated and Kolesnik teaches:

the coders in parallel are adapted to operate multimode coding and an a posteriori selection module is provided capable of selecting one of the coders; (Kolesnik, Fig. 2A , shows a parallel multi-mode coding scheme and the comparator and controller (210) is shown to select the mode.)

a partial selection module is provided that is independent of the coders and able to select one or more coders after each coding step conducted by one or more functional units; and (Kolesnik, column 12, lines 25-28, …*FIG. 4 shows an implementation of the variable rate LSP encoder 202. The LSP encoder 202 uses m quantized LSPs and comprises three schemes for LSP predicting and preliminary coding*…, As shown in Fig. 4, there is a codeword selector (412) that teaches a partial selection module because it selects the results supplied by the function units of the variable rate encoders prior to the encoding (213) as shown in Fig. 2A where Fig. 2A highlights the variable rate LSP encoder (202) in general.)

the partial selection module is used after a split vector quantization step for short-term parameters (Kolesnik, column 5, lines 60-67, …*Pre-filtered speech is analyzed by short-term prediction analyzer 201. Short-term prediction analyzer 201 includes a linear prediction analyzer, a converter from linear prediction coefficients (LPC) into line spectrum pairs (LSPs) and a quantizer of the LSPs*… Kolesnik analyzes short-term parameters prior to the partial selection module as defined above. It would have been obvious to someone of ordinary skill in the art that split vector quantization could be used to analyze the short-term parameters because it is well known in the art. This can

be seen in, Kolesnik, column 3, lines 12-16, which discloses "The most effective approaches of this type are split-vector quantization, disclosed in "Efficient Vector Quantization of LPC Parameters at 24 bits/frame," K. K. Paliwal and B. S. Atal, Proceedings of the 1991 IEEE International Conference on Acoustics, Speech and Signal Processing, pp. 661-664, May 1991…")

As per claim 23, claim 21 is incorporate and Kolesnik teaches:

the coders in parallel are adapted to operate multimode coding and an a posteriori selection module is provided capable of selecting one of the coders; (Kolesnik, Fig. 2A , shows a parallel multi-mode coding scheme and the comparator and controller (210) is shown to select the mode.)

a partial selection module is provided that is independent of the coders and able to select one or more coders after each coding step conducted by one or more functional units; and (Kolesnik, column 12, lines 25-28, …*FIG. 4 shows an implementation of the variable rate LSP encoder 202. The LSP encoder 202 uses m quantized LSPs and comprises three schemes for LSP predicting and preliminary coding*…, As shown in Fig. 4, there is a codeword selector (412) that teaches a partial selection module because it selects the results supplied by the function units of the variable rate encoders prior to the encoding (213) as shown in Fig. 2A where Fig. 2A highlights the variable rate LSP encoder (202) in general.)

Kolesnik fail to teach, but Jabri teaches:

the partial selection module is used after a shared open loop long-term parameter search step. (Jabri, coumn 6, lines 8-24, teaches … *The intermediate parameters of open-loop pitch lag and excitation signal are usually generic to CELP codecs*… These parameters are shared, (Fig .7). It would have been obvious that if the open-loop long term parameters are based on the perceptually weighted speech signal, that they would be performed prior to the partial selection module in Kolesnik because the weighting is done directly after pre-filtering.)

It would have been obvious to someone of ordinary skill in the art at the time of the invention to combine Jabri with Kolesnik to reduce program size and computational cost by performing common functions once and distributing their results. (column 2, lines 35-59 and column 4, lines 26-39)

As per claim 24, Kolesnik teaches:

a computer readable medium storing a computer program product in memory, said computer readable medium including instructions for implementing a multiple compression coding method for operating a coding apparatus comprising at least a first coder and a second coder that both utilize a plurality of coding techniques, the apparatus being fed with an input signal, said input signal being inputted in parallel to at least the first and second coders, each of the first and second coders comprising a succession of functional units, for compression coding of the input signal by each of the first and second coders, (Kolesnik, claim 1, teaches the method incorporated in a computer system. A computer system requires a computer readable medium which

is programmed. Further, Kolesnik, Fig. 2A and Fig. 4, show a parallel multi-mode coding scheme and the comparator and controller (210) is shown to select the mode.)

Kolesnik fails to specifically teach, but Jabri teaches:

at least a part of said functional units performing calculations for delivering respective parameters for the coding of the input signal by each coder, (Jabri, coumn 6, lines 8-24, teaches …*The unquantized values for linear prediction parameters, pitch lags, and pitch gains are also usually generic CELP parameters*… Fig. 7 further teaches generic pre-processing.)

the first and second coders respectively comprising at least a first and a second functional unit arranged for performing common operations. (Jabri, coumn 6, lines 8-24, teaches …*The unquantized values for linear prediction parameters, pitch lags, and pitch gains are also usually generic CELP parameters*… Fig. 7 further teaches generic pre-processing and coding which are common operations.)

wherein calculations for delivering a same set of parameters to the first functional unit and to the second functional unit are performed in a same step and in a same functional unit, (Jabri, coumn 6, lines 8-24, teaches …*The unquantized values for linear prediction parameters, pitch lags, and pitch gains are also usually generic CELP parameters*… Fig. 7 further teaches generic pre-processing and coding in a shared space.)

It would have been obvious to someone of ordinary skill in the art at the time of the invention to combine Jabri with Kolesnik to reduce program size and computational

cost by performing common functions once and distributing their results. (column 2, lines 35-59 and column 4, lines 26-39)

Kolesnik and Jabri fail to specifically teach, but Seo teaches:

if at least one of the first and the second coder operates at a rate that is different from a rate of a common functional unit, adapting the parameters to the respective rate of at least one respective said first coder and said second coder in order to be used by the at least one of said first and second functional unit respectively; and
(Seo, section 2.2, teaches a rate-determination algorithm based on the classification. It would have been obvious to someone of ordinary skill in the art to apply a rate adaptation to adjust the rate based on the differences between the functional units and the respective coders.)

if the first and the second coders operate at a rate that is the same as a rate of a common functional unit, then providing the parameters to the first and second functional units without adaptation. (Seo, section 2.2, teaches a rate-determination algorithm based on the classification. It would have been obvious to someone of ordinary skill in the art at the time of the invention that if the rates of the functional units and the respective coders are equivalent, no rate adaptation is necessary.)

It would have been obvious to someone of ordinary skill in the art at the time of the invention to combine Seo with Kolesnik and Jabri to use a rate-determination algorithm to adapt between coded information of different bitrates for transcoding between the generation of common parameters (such as generating line spectral pairs)

through the functional units and the respective coders.

Claim 25 is rejected for the same reasons as claim 24 for having similar limitations. The additional limitation of a system is provided by Kolesnik claim 1 which teaches the method as being operable in a computer system, which is an apparatus for implementing the system.

As per claim 26, claim 25 is incorporated and Kolesnik fails to specifically teach, but Jabri teaches:

identifying the functional units forming each coder and one or more functions implemented by each unit; (Jabri, coumn 6, lines 8-24, teaches …*The unquantized values for linear prediction parameters, pitch lags, and pitch gains are also usually generic CELP parameters*…)

marking functions that are common from one coder to another; (Jabri, coumn 6, lines 8-24, teaches …*The unquantized values for linear prediction parameters, pitch lags, and pitch gains are also usually generic CELP parameters*… Figs. 7 and 9 further teaches generic pre-processing and coding which are common operations.)

executing said common functions only one time for the input signal for at least some of the coders in a common calculation module. (Fig. 7 shows that generic operations are performed to reduce redundancy.)

It would have been obvious to someone of ordinary skill in the art at the time of

the invention to combine Jabri with Kolesnik to reduce program size and computational cost by performing common functions once and distributing their results. (column 2, lines 35-59 and column 4, lines 26-39)

Claim 28 is rejected for the same reasons as claim 26.

As per claim 29, Kolesnik teaches:

feeding an input signal in parallel to an apparatus comprising a plurality of coders, each including a succession of functional units for compression coding of said signal by each coder, wherein each coder comprises a different combination of functional units; (Kolesnik, Fig. 2A and Fig. 4, show a parallel multi-mode coding scheme and the comparator and controller (210) is shown to select the mode. Further, Fig. 4, column 12, lines 25-33, …*comprises three schemes for LSP predicting and preliminary coding*…)

Kolesnik fails to specifically teach, but Jabri teaches:

identifying the functional units forming each coder and one or more functions implemented by each unit; (Jabri, coumn 6, lines 8-24, teaches …*The unquantized values for linear prediction parameters, pitch lags, and pitch gains are also usually generic CELP parameters*…)

marking functions that are common from one coder to another; (Jabri, coumn 6, lines 8-24, teaches …*The unquantized values for linear prediction*

parameters, pitch lags, and pitch gains are also usually generic CELP parameters… Figs. 7 and 9 further teaches generic pre-processing and coding which are common operations.)

executing, via a processor unit, said common functions only one time for the input signal for at least some of the coders in a common calculation module; and (Fig. 7 shows that generic operations are performed to reduce redundancy.)

producing and feeding a coded output signal from the apparatus based at least in part on the common functions; (Jabri, Fig. 9, the generic calculations are used to generate the codec bitstream.)

wherein said calculation module is independent of said coders and is adapted to redistribute results obtained in the executing step to all the coders; and (Jabri, coumn 6, lines 8-24, teaches …*The unquantized values for linear prediction parameters, pitch lags, and pitch gains are also usually generic CELP parameters…* Fig. 3 and Fig. 7 further teach generic parameters (common operations). Fig. 7's “generic” processing and encoding steps are independent of the specific processing and encoding steps.)

the independent module and the functional unit or units of at least one of the coders are adapted to exchange results obtained in the executing step with each other and (Jabri, coumn 6, lines 8-24, teaches …*The unquantized values for linear prediction parameters, pitch lags, and pitch gains are also usually generic CELP parameters…* Fig. 3 and Fig. 7 further teach generic parameters (common operations). Fig. 7's “generic” processing and encoding steps are used to generate codec bitstreams

including specific information specific to the codecs.)

It would have been obvious to someone of ordinary skill in the art at the time of the invention to combine Jabri with Kolesnik to reduce program size and computational cost by performing common functions once and distributing their results. (column 2, lines 35-59 and column 4, lines 26-39)

Kolesnik and Jabri fail to specifically teach, but Seo teaches:

the calculation module is adapted to effect adaptation transcoding between functional units of different coders. (Seo, abstract and section 3.2, teaches a transcoding technique using direct parameter transformation. Line Spectral Pairs are directly converted to reduce algorithmic delay. Jabri, Fig. 3 teaches that linear prediction parameters are generic where linear prediction parameters are used to generate LSP's.

Therefore, it would have been obvious to someone of ordinary skill in the art at the time of the invention to combine Seo with Kolesnik and Jabri to transcode between SMV and G.723.1 by a direct parameter transformation instead of tandem transcoding because computational complexity is reduced. (Seo, Section 3.2)

13. Claims 27 is rejected under 35 U.S.C. 103(a) as being taught by Kolesnik et al. (US Patent # 5729655) in view of Jabri et al. (US Patent #7254533)

As per claim 27, Kolesnik teaches:

providing a multiple compression coding via a plurality of coding techniques by

a plurality of coders comprising at least a first coder and a second coder; (Kolesnik, Fig. 2A and Fig. 4, show a parallel multi-mode coding scheme and the comparator and controller (210) is shown to select the mode.)

feeding an input signal in parallel to an apparatus comprising the plurality of coders, each including a succession of functional units for compression coding of said signal by each coder, wherein each coder comprises a different combination of functional units; (Fig. 4, column 12, lines 25-33, …*comprises three schemes for LSP predicting and preliminary coding*…)

Kolesnik fails to specifically teach, but Jabri teaches:

identifying the functional units forming each coder and one or more functions implemented by each unit; (Jabri, coumn 6, lines 8-24, teaches …*The unquantized values for linear prediction parameters, pitch lags, and pitch gains are also usually generic CELP parameters*…)

marking functions that are equivalent from one coder to another; (Jabri, coumn 6, lines 8-24, teaches …*The unquantized values for linear prediction parameters, pitch lags, and pitch gains are also usually generic CELP parameters*… Figs. 7 and 9 further teaches generic pre-processing and coding which are common operations.)

selecting a function executed by a given coder amongst the functions that are equivalent, and executing, via a processor unit, said functions with parameters related to the given coder only one time for the input signal for at least some of the coders in a

common calculation module; (Jabri, coumn 6, lines 8-24, teaches …*The unquantized values for linear prediction parameters, pitch lags, and pitch gains are also usually generic CELP parameters*… Figs. 7 and 9 further teaches generic pre-processing and coding which are common operations.)

adapting a result obtained from the execution of the function in the selecting and executing step for a use in at least a part of the plurality of coders; and (Jabri, Fig. 9, the generic calculations are used to generate the codec bitstream.)

producing and feeding a coded output signal from the apparatus based at least in part on the common functions. (Jabri, Fig. 9, the generic calculations are used to generate the codec bitstream.)

It would have been obvious to someone of ordinary skill in the art at the time of the invention to combine Jabri with Kolesnik to reduce program size and computational cost by performing common functions once and distributing their results. (column 2, lines 35-59 and column 4, lines 26-39)

14. Claims 17-20 are rejected under 35 U.S.C. 103(a) as being taught by Kolesnik et al. (US Patent # 5729655) in view of Jabri et al. (US Patent #7254533) and further in view of Seo et al. (NPL Document "A Novel Transcoding Algorithm for SMV and G.723.1 Speech Coders via Direct Parameter Transformation") and further in view of Aguilar et al. (US Patent #7272556 hereinafter Aguilar).

As per claim 17, claim 1 is incorporated and Kolesnik fail to fully teach, but Jabri

teaches:

the calculation module includes a bit assignment functional unit shared between all the coders, each bit assignment effected for one coder being followed by an adaptation to that coder, (Jabri, Fig. 3 and Fig. 7 further teach generic parameters (common operations). Fig. 7 shows "generic" processing and encoding steps. Fig. 9 further shows that the generic operations (which are shared) go into a bitstream packer (bit assignment). The bitstream packer operates as a function of the bit rate.)

It would have been obvious to someone of ordinary skill in the art at the time of the invention to combine Jabri with Kolesnik to reduce program size and computational cost by performing common functions once and distributing their results. (column 2, lines 35-59 and column 4, lines 26-39)

Kolesnik, Jabri, and Seo fail to teach, but Aguilar teaches:

the coders are of the transform type. (Aguilar, column 4, lines 1-3, …*Yet another object of the present invention is to provide a transform codec with multiple stages of increasing complexity and bit-rates*… Aguilar provides a transform coder in a multimode system.)

Aguilar, Jabri and Kolesnik are analogous art because both pertain to compression coding for audio signals. It would have been obvious to someone of ordinary skill in the art to combine Aguilar with the Kolesnik, Jabri, and Seo device because Aguilar is an analogous invention which uses transform coders instead of

CELP coders. Thus, it would have been obvious to switch the coders for either transform or CELP coders because they are functionally equivalent elements.

As per claim 18, claim 17 is incorporated and Kolesnik teaches:

the method further includes a quantization step the results whereof are supplied to all the coders. (Kolesnik, column 5, lines 48-67, …*Short-term prediction analyzer 201 includes a linear prediction analyzer, a converter from linear prediction coefficients (LPC) into line spectrum pairs (LSPs) and a quantizer of the LSPs*… The LSP's are quantized prior to coding (Fig. 4).)

As per claim 19, claim 18 is incorporated and Kolesnik, Jabri, and Seo fail to teach, but Aguilar teaches:

it further includes steps common to all the coders including: a time-frequency transform; (Aguilar, column 8, lines 8-13, …*in accordance with the present invention, the band splitter 5 can be implemented as a filter bank, an FFT transform or wavelet transform computing device, or any other device that can split a signal into several signals representing different frequency bands*… An FFT transform is a time-frequency transform.)

detection of voicing in the input signal; (Aguilar, column 10, lines 57-65, ...*In speech applications it is usually necessary to provide a measure of how voiced (i.e., how harmonic) the signal is at a given time, and a measure of its volume or its gain. In very low bit-rate applications in accordance with the present invention one can*

therefore only transmit a harmonic frequency, a voicing probability indicating the extent to which the spectrum is dominated by voice harmonics, a gain, and a set of parameters which correspond to the spectrum envelope of the signal… Aguilar provides a measure of how voiced the signal at a given time is, which inherently means it would be detected.)

detection of tonality; (Aguilar, column 13, lines 60-64, ...*The refined pitch estimate obtained in block 70 and the SEEVOC flat-top spectrum envelope are used to create in block 80 of the analyzer a smooth estimate of the spectral envelope using in a preferred embodiment cubic spline interpolation between peaks*… The pitch estimate would inherently be a detection of tonality because by estimating the pitch would determine a pitch amplitude which would be indicative of the tonality of the speech or audio input.)

determination of a masking curve; (Aguilar, column 19, lines 35-37, ...*In a preferred embodiment of the present invention, the masking envelope is computed as an attenuated LPC spectrum of the signal in the frame. This selection gives good results, since the LPC envelope is known to provide a good model of the peaks of the spectrum if the order of the modeling LPC filter is sufficiently high*…The masking envelope teaches a masking curve for eliminating low side effects.)

spectral envelope coding; (Aguilar, column 10, lines 48-51, ...*The next block in FIG. 3A shows that instead of transmitting the magnitudes of each sinusoid, one can only transmit information about the spectrum envelope of the signal*… By transmitting the spectral envelope, it would inherently be coded.)

Aguilar, Jabri and Kolesnik are analogous art because both pertain to compression coding for audio signals. It would have been obvious to someone of ordinary skill in the art to combine Aguilar with the Kolesnik, Jabri, and Seo device because Aguilar is an analogous invention which uses transform coders instead of CELP coders. Thus, it would have been obvious to switch the coders for either transform or CELP coders because they are functionally equivalent elements.

As per claim 20, claim 17 is incorporated and Kolesnik, Jabri, and Seo fail to teach, but Aguilar teaches:

application of a bank of analysis filters; (Aguilar, column 8, lines 8-13, *...in accordance with the present invention, the band splitter 5 can be implemented as a filter bank, an FFT transform or wavelet transform computing device, or any other device that can split a signal into several signals representing different frequency bands…)*

determination of scaling factors; (Aguilar, column 10, lines 54-57, ...*As known in the art, the spectrum envelope can be encoded using different parameters, such as LPC coefficients, reflection coefficients (RC), and others…* The coefficients are scaling factors.)

spectral transform calculation; (Aguilar, column 17, lines 7-11, ...*In the following block 35, the magnitude and unwrapped phase envelopes are upsampled to 256 points using linear interpolation in a preferred embodiment. Alternatively, this could be done using the Discrete Cosine Transform (DCT) approach described in Section*

E.1…)

determination of masking thresholds in accordance with a psycho-acoustic model; (Aguilar, column 19, lines 17-21, ...*Block 240 computes a masking envelope that provides a dynamic thresholding of the signal spectrum to facilitate the peak picking operation in the following block 250, and to eliminate certain low-level peaks, which are not associated with the harmonic structure of the signal…* The harmonic structure teaches the psycho-acoustic model and thus the masking envelope creates thresholds in accordance with a psycho-acoustic model.)

Aguilar, Jabri and Kolesnik are analogous art because both pertain to compression coding for audio signals. It would have been obvious to someone of ordinary skill in the art to combine Aguilar with the Kolesnik, Jabri, and Seo device because Aguilar is an analogous invention which uses transform coders instead of CELP coders. Thus, it would have been obvious to switch the coders for either transform or CELP coders because they are functionally equivalent elements.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Refer to PTO-892, Notice of References Cited for a listing of analogous art.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREG A. BORSETTI whose telephone number is (571)270-3885, (FAX: 571-270-4885). The examiner can normally be reached on

Monday - Thursday (8am - 5pm Eastern Time).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, RICHEMOND DORVIL can be reached on 571-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Greg A. Borsetti/
Examiner, Art Unit 2626

/Talivaldis Ivars Smits/
Primary Examiner, Art Unit 2626 12/9/2009